Soybean Germplasm Committee Meeting
February 12, 2024

The meeting was called to order by chair Ben Fallen.

Members present were:

Benjamin Fallen, Chair (USDA-ARS, Raleigh, NC term 2024-2026) and Public Breeder South (term 2023 - 2028)

Pedro Gonzalez, Vice-chair and Private Breeder North (Benson Hill, term 2023 - 2028)

Adam Mahan, *ex officio* Curator (USDA-ARS, Urbana, IL)

Benjamin Bartlett, Secretary and *ex officio* Assistant Curator (USDA-ARS, Urbana, IL)

Rusty Smith, *ex officio* Associate Curator (USDA-ARS, Stoneville, MS)

Michaela McGinn, *ex officio* SmithBucklin/United Soybean Board representative

Jon Allen, Pathologist (Corteva, term 2023 - 2026)

Ian McNish, Pathologist (Syngenta, term 2023 - 2026)

Alvaro Sanz-Saez, Physiologist (Auburn University, term 2023 - 2026)

Milad Eskandari, Canadian breeder (term 2021 - 2024)

Innan Cervantes Martinez, Private Breeder South (term 2023 - 2028)

Jason Gilman, Genomics/Molecular biology (term 2023 - 2026)

Guo-Liang Jiang, Geneticist (Virginia State University, term 2023 - 2026)

Members not present:

Roy Scott, *ex officio* National Program Staff representative

Aaron Lorenz, Public Breeder North (term 2023-2026)

Incoming members present:

Elroy Cober, Canadian breeder (AAFC, term 2025 - 2028)

The meeting began with Ben Fallen calling the meeting to order. Everyone attending the meeting introduced themselves to the other members.

The Minutes for the 2023 Soybean Germplasm Committee were approved without dissent.

The Annual Report of the USDA Soybean Germplasm Committee was presented by Adam Mahan. The following items from the Annual Report were discussed:

Lezlie Furr joined the Research Unit as the Program Support Assistant. Currently, vacant positions are open for an Agricultural Scientist Research Technician and Research Geneticist, with the latter having conducted interviews and the offer process is ongoing.

In 2023, the Collection staff distributed 16,687 seed packets encompassing 9,536 accessions from the Collection in response to 380 requests from 232 individuals in the United States and 17 countries. Most requests (16,483) come from Glycine max (soybean) and/or G. soja (wild soybean) every year. However, 9 requests for 204 seed packets of 166 Glycine spp. (perennial Glycine) accessions were distributed in 2023. Backup seed samples for 693 accessions were sent to Ft. Collins NLGRP early in 2024.

A significant rain event shortly after planting saturated the soybean seeds in the ground, causing crust formation before seedling emergence. The region continued to face abnormally dry conditions throughout the remainder of the growing season which facilitated the development of Charcoal Rot on several plots.

A water reel was purchased in response to this year's drought conditions. Likewise, a new 4-row cultivator was purchased to control weed populations. A new 2-row combine was purchased in 2023 to replace the 30+ year old 2-row combine.

The Collection staff grew 2,193 accessions for seed replacement in 2023: 1,086 accessions at Urbana, Illinois; 657 accessions at Stoneville, Mississippi; 294 accessions at Costa Rica; and 56 accessions at Puerto Rico. For the earliest maturing accessions grown in Urbana, we also had a duplicate increase this year in Fargo, ND, thanks to the cooperation of Carrie Miranda and NDSU. A total of 1,962 accessions of G. max, 133 of G. soja, and 98 of perennial Glycine were grown for seed replenishment in 2023.

In 2023, the collection added 37 new accessions, comprised of 6 germplasm releases, 11 public cultivars, and 20 private varieties with expired plant variety protection certificates.

Adam Mahan was appointed as the chair of the committee overseeing guidance for GE cultivars within the NPGS. The committee has received clearance to distribute accessions with GE traits involving herbicide resistance. Discussions between NPGS and EPA have not reached a conclusion on how to treat ex-PVP cultivars with expired GE insecticide traits.

Beginning on or about January 1, 2024, the U.S. National Plant Germplasm System (NPGS) will distribute all germplasm to international requestors (outside the U.S. states and territories) with the Standard Material Transfer Agreement (SMTA) of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA). The Soybean Crop Vulnerability Statement from 2020 highlights the importance of conducting a survey of the Collection for both nutritional value and disease screening. The latest Farm Bill (2018) incorporates the National Strategic Germplasm and Cultivar Collection Assessment and Utilization Plan.

USDA-ARS Midwest Area has tentatively secured capital investment to install a dedicated -18˚C cold room. The funding is due to the cold-room needs of the collection being added to the High Priority project list that is annually updated by the Midwest Area administration. This investment will also replace the refrigeration and dehumidification equipment for the primary cold-room which routinely maintains seed at 8-10 ˚C and 35-40% humidity. When the project is complete, the primary cold-room will maintain a 4˚C and 28% humidity environment.

The Collection primarily accepts improved cultivars that carry either a Journal of Plant Registration (JPR) designation, a Plant Variety Protection (PVP) certificate, or another varietal release documentation. Typically, JPR accessions become available for release after a period of five years, unless otherwise specified by the authors. It is the responsibility of Collection staff to review the JPR documentation to determine the release date. This process ensures that only authorized and properly documented cultivars are included in the Collection.

The Collection regularly sends seed to Puerto Rico for increases and relies on Puerto Rico staff for evaluation. However, errors can occur during the evaluation process, particularly with certain accessions that may have smaller plant sizes and are more prone to inaccuracies from off-types. It is essential for Collection staff to be aware of these potential issues and take necessary precautions to minimize errors, such as providing detailed documentation and instructions for handling and evaluating each accession. Additionally, regular communication and collaboration between Collection staff and evaluation teams in Puerto Rico can help address any discrepancies and ensure accurate assessment of the germplasm.

Certain soybean accessions have garnered more research attention and are potentially more amenable to crossbreeding. Several strategies can be employed to document these trends. A thorough review of existing literature can uncover which accessions have been frequently cited in research studies, offering insights into their popularity and potential ease of use in crossing experiments. Additionally, examining database records maintained by germplasm collections can reveal which accessions have been frequently requested or utilized by researchers. Gathering feedback directly from researchers through surveys or interviews can provide valuable insights into their experiences and preferences regarding working with different accessions. Pedigree analysis of soybean accessions can also shed light on their suitability for crossing experiments, particularly those with well-documented parentage and breeding history. By employing these methods, germplasm collections can compile valuable information to assist researchers in selecting appropriate accessions for their studies.

Adam Maham provided clarification on the *G. max* × *G. tomentella* hybrids that had been reported several years previously. These lines are still undergoing some testing, but so far none of the purported hybrids have been validated as containing *G. tomentella* DNA.

Researchers are responsible for citing plant material correctly that is sourced from the Collection. This practice ensures proper documentation and acknowledgment of the use of germplasm or other resources from the Collection in research studies. By submitting relevant journal articles, researchers contribute to the transparency and traceability of research outcomes, allowing others in the scientific community to access and build upon the findings. Additionally, this process helps germplasm collections track the impact and usage of their resources, facilitating future research efforts and resource allocation.

The genetic quality of the Collection undergoes ongoing evaluation, with a significant portion already genotyped using the 50K SNP chip, accessible on SoyBase. However, newer varieties have not yet undergone this genotyping process. Roy Scott remarked last year that there aren't any restrictions for genotyping these exPVPs before the USDA distribution policy is implemented. However, such a project will require funding.

No other business was discussed and the meeting was adjourned.

Submitted by Benjamin Bartlett, Secretary and Assistant Soybean Curator